

NMCP COVID-19 Literature Report #55: Friday, 15 January 2021

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Purpose: These weekly reports, published on Fridays, are curated collections of current research, evidence reviews, special reports, grey literature, and news regarding the COVID-19 pandemic that may be of interest to medical providers, leadership, and decision makers.

All reports are available online at <https://nmcp.libguides.com/covidreport>. Access is private; you will need to use the direct link or bookmark the URL, along with the case-sensitive password "NMCPfinest".

Disclaimer: I am not a medical professional. This document is current as of the date noted above. While I make every effort to find and summarize available data, I cannot cover everything in the literature on COVID-19. Please feel free to reach out with questions, suggestions for future topics, or any other feedback.

Statistics

Global today: 93,275,676 confirmed cases and 1,997,704 deaths in 191 countries/regions

08 JAN 2021: 88,203,229 confirmed cases and 1,901,510 deaths in 191 countries/regions

30 DEC 2020: 82,100,010 confirmed cases and 1,793,150 deaths in 191 countries/regions

*United States**

top 5 states by cases

	TOTAL US	CA	TX	FL	NY	IL
Cases	23,323,615	2,883,714	2,069,059	1,531,192	1,193,453	1,052,682
Deaths	388,887	32,322	31,693	23,613	40,435	19,724

*see census.gov for current US Population data; NA: not all data available

[JHU CSSE](https://www.jhu.edu/) as of 1000 EDT 15 January 2021

Virginia is ranked 18th in cases and 24th in deaths.

	Total (state)	Chesapeake	Hampton	Newport News	Norfolk	Portsmouth	Suffolk	Virginia Beach
Cases	422,634	11,536	5,434	7,454	10,746	5,546	4,700	21,680
Hospitalizations	19,741	670	212	225	626	471	266	905
Deaths	5,656	113	57	76	123	90	100	175

[VA DOH](https://www.vahhs.org/) as of 1000 EDT 15 January 2021

New Year, Same Old Pandemic (But Newish Network Problems)

BLUF: Use Firefox and ask a librarian.

Welcome to 2021, year 2 of the COVID-19 pandemic. There has been a lot going on this first week of January. One thing you may have noticed in all the chaos is problems getting to full text articles and/or library resources, especially when on a networked computer.

For example, if you are in PubMed and click on our access buttons, you may get a login screen and then an error message about a "Bad Request" message. You may also have problems opening up PDFs, sites asking for a DHA login, or see that content is blocked by "Menlo Security".

Library Services is working on solutions. In the meantime, the best thing to do when on an NMCP networked computer (or using VPN) is to use Firefox as your browser, rather than IE/Edge or Chrome. (If you don't see Firefox on your NMCP computer, look for it in the Software Center and download.) You should have fewer problems when off the network and using your OpenAthens account login. This not a perfect fix, but it takes care of many problems.

If you still have problems getting to library resources or need help with OpenAthens, contact Library Services: email usn.hampton-roads.navhospporsva.list.nmcp-library@mail.mil or phone 757-953-5384. Tell us what browser you are using and what you are encountering. We may ask several clarifying questions before we can give you a solution, so please bear with us as we work through these access issues.

Special Reports and Events

NIH: [The COVID-19 Treatment Guidelines Panel's Statement on the Use of Ivermectin for the Treatment of COVID-19](#) (updated 14 January 2021)

"The COVID-19 Treatment Guidelines Panel (the Panel) has determined that currently there are insufficient data to recommend either for or against the use of ivermectin for the treatment of COVID-19. Results from adequately powered, well-designed, and well-conducted clinical trials are needed to provide more specific, evidence-based guidance on the role of ivermectin for the treatment of COVID-19."

CDC Clinician Outreach and Communication Act (COCA) Call: [Treating Long COVID: Clinician Experience with Post-Acute COVID-19 Care](#)

WHEN: Thursday, 28 January 28 2021, 1440–1500 ET

OVERVIEW: "For some people, the effects of COVID-19 can last well beyond the immediate illness. Patients and clinicians across the United States are reporting long-term effects of COVID-19, commonly referred to as long COVID. Symptoms may include cognitive

difficulties, fatigue, and shortness of breath. In some patients, critical illness from COVID-19 may be the cause of persistent symptoms, but many patients with long-term effects had mild or asymptomatic acute COVID-19 infection. During this COCA Call, presenters will share their firsthand experiences with treating long COVID, focusing on the pulmonary, neurologic, and psychological aspects. They will also describe their experiences with establishing clinics that provide care for patients with these long-term effects."

LINK: https://emergency.cdc.gov/coca/calls/2021/callinfo_012821.asp

Selected Literature: Peer-Reviewed Journals

Date given is the date published or posted online; often these papers are ahead of print.

15 January 2021

MMWR: [Mitigation Policies and COVID-19–Associated Mortality — 37 European Countries, January 23–June 30, 2020](#)

"What is already known about this topic? Mitigation policies, including closure of nonessential businesses, restrictions on gatherings and movement, and stay-at-home orders, have been critical to controlling the COVID-19 pandemic in many countries, but they come with high social and economic costs.

What is added by this report? European countries that implemented more stringent mitigation policies earlier in their outbreak response tended to report fewer COVID-19 deaths through the end of June 2020. These countries might have saved several thousand lives relative to countries that implemented similar policies, but later.

What are the implications for public health practice? Earlier implementation of stringent mitigation policies, even by just a few weeks, appears to be important to prevent widespread COVID-19 transmission and reduce the number of deaths."

14 January 2021

JAMA Cardiol: [Evaluation for Myocarditis in Competitive Student Athletes Recovering From Coronavirus Disease 2019 With Cardiac Magnetic Resonance Imaging](#)

"Question: What is the utility of cardiac magnetic resonance imaging (MRI) as a part of a comprehensive screening program to evaluate student athletes recovering from coronavirus disease 2019 (COVID-19)?

Findings: In this study of 145 student athletes with COVID-19 who had mild to moderate symptoms or no symptoms during acute infection, cardiac MRI findings (at a median of 15 days after a positive test result for COVID-19) were consistent with myocarditis in only 2 patients (1.4%), based on updated Lake Louise criteria.

Meaning: Based on a low prevalence of COVID-19–associated findings consistent with myocarditis in 145 competitive student athletes with mild to moderate or no COVID-19 symptoms and normal serum study results, the utility of cardiac MRI as a screening tool for myocarditis was low and concordant with normal laboratory serum assays."

JAMA Oncol: [Cancer Screening Tests and Cancer Diagnoses During the COVID-19 Pandemic](#)

"This cohort study describes the number of patients undergoing cancer screening tests and of ensuing cancer diagnoses during the COVID-19 pandemic in 1 health care system in the northeastern United States."

JAMA Ophthalmol: [Progression of Myopia in School-Aged Children After COVID-19 Home Confinement](#)

"Question: Is home confinement due to coronavirus disease 2019 associated with the burden of myopia?

Findings: In this cross-sectional study that included 194 904 photoscreening tests conducted in 123 535 children, a substantial myopic shift (–0.3 diopters) was noted after home confinement due to coronavirus disease 2019 for children aged 6 to 8 years. The prevalence of myopia increased 1.4 to 3 times in 2020 compared with the previous 5 years.

Meaning: Home confinement due to coronavirus disease 2019 appeared to be associated with a substantial myopic shift in children; younger (aged 6–8 years) children’s refractive status may be more sensitive to environmental changes than older children, given that they are in an important period for the development of myopia."

JAMA Otolaryngol Head Neck Surg: [Socioeconomic Disparities in Patient Use of Telehealth During the Coronavirus Disease 2019 Surge](#)

"Question: What demographic and socioeconomic factors were associated with patient participation in telehealth during the coronavirus disease 2019 (COVID-19) pandemic surge?

Findings: In a cohort study of 1162 patients at a large, urban tertiary care center in the Midwest, age, sex, median household income, insurance status, and marital status were associated with patient participation in telehealth during the COVID-19 pandemic surge.

Meaning: Similar characteristics that are associated with inequitable access to in-person medical care are also associated with inequitable access to telehealth; a focus on vulnerable

patient populations in a changing landscape is necessary to provide timely and essential medical care."

13 January 2021

NEJM: [Interim Results of a Phase 1–2a Trial of Ad26.COV2.S Covid-19 Vaccine](#)

Johnson & Johnson COVID-19 vaccine data: "Efficacious vaccines are urgently needed to contain the ongoing coronavirus disease 2019 (Covid-19) pandemic of infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). A candidate vaccine, Ad26.COV2.S, is a recombinant, replication-incompetent adenovirus serotype 26 (Ad26) vector encoding a full-length and stabilized SARS-CoV-2 spike protein.

In this multicenter, placebo-controlled, phase 1–2a trial, we randomly assigned healthy adults between the ages of 18 and 55 years (cohort 1) and those 65 years of age or older (cohort 3) to receive the Ad26.COV2.S vaccine at a dose of 5×10^{10} viral particles (low dose) or 1×10^{11} viral particles (high dose) per milliliter or placebo in a single-dose or two-dose schedule. Longer-term data comparing a single-dose regimen with a two-dose regimen are being collected in cohort 2; those results are not reported here. The primary end points were the safety and reactogenicity of each dose schedule.

After the administration of the first vaccine dose in 805 participants in cohorts 1 and 3 and after the second dose in cohort 1, the most frequent solicited adverse events were fatigue, headache, myalgia, and injection-site pain. The most frequent systemic adverse event was fever. Systemic adverse events were less common in cohort 3 than in cohort 1 and in those who received the low vaccine dose than in those who received the high dose.

Reactogenicity was lower after the second dose. Neutralizing-antibody titers against wild-type virus were detected in 90% or more of all participants on day 29 after the first vaccine dose (geometric mean titer [GMT], 224 to 354) and reached 100% by day 57 with a further increase in titers (GMT, 288 to 488), regardless of vaccine dose or age group. Titers remained stable until at least day 71. A second dose provided an increase in the titer by a factor of 2.6 to 2.9 (GMT, 827 to 1266). Spike-binding antibody responses were similar to neutralizing-antibody responses. On day 14, CD4+ T-cell responses were detected in 76 to 83% of the participants in cohort 1 and in 60 to 67% of those in cohort 3, with a clear skewing toward type 1 helper T cells. CD8+ T-cell responses were robust overall but lower in cohort 3.

The safety and immunogenicity profiles of Ad26.COV2.S support further development of this vaccine candidate."

NEJM: [Convalescent Plasma Antibody Levels and the Risk of Death from Covid-19](#)

"In a retrospective study based on a U.S. national registry, we determined the anti-SARS-CoV-2 IgG antibody levels in convalescent plasma used to treat hospitalized adults with Covid-19. The primary outcome was death within 30 days after plasma transfusion. Patients who were enrolled through July 4, 2020, and for whom data on anti-SARS-CoV-2 antibody levels in plasma transfusions and on 30-day mortality were available were included in the analysis.

Of the 3082 patients included in this analysis, death within 30 days after plasma transfusion occurred in 115 of 515 patients (22.3%) in the high-titer group, 549 of 2006 patients (27.4%) in the medium-titer group, and 166 of 561 patients (29.6%) in the low-titer group. The association of anti-SARS-CoV-2 antibody levels with the risk of death from Covid-19 was moderated by mechanical ventilation status. A lower risk of death within 30 days in the high-titer group than in the low-titer group was observed among patients who had not received mechanical ventilation before transfusion (relative risk, 0.66; 95% confidence interval [CI], 0.48 to 0.91), and no effect on the risk of death was observed among patients who had received mechanical ventilation (relative risk, 1.02; 95% CI, 0.78 to 1.32).

Among patients hospitalized with Covid-19 who were not receiving mechanical ventilation, transfusion of plasma with higher anti-SARS-CoV-2 IgG antibody levels was associated with a lower risk of death than transfusion of plasma with lower antibody levels."

Occup Med: [Mental health of staff working in intensive care during COVID-19](#)

"Staff working in intensive care units (ICUs) have faced significant challenges during the COVID-19 pandemic which have the potential to adversely affect their mental health.

To identify the rates of probable mental health disorder in staff working in ICUs in nine English hospitals during June and July 2020.

An anonymized brief web-based survey comprising standardized questionnaires examining depression, anxiety symptoms, symptoms of post-traumatic stress disorder (PTSD), well-being and alcohol use was administered to staff.

Seven hundred and nine participants completed the surveys comprising 291 (41%) doctors, 344 (49%) nurses and 74 (10%) other healthcare staff. Over half (59%) reported good well-being; however, 45% met the threshold for probable clinical significance on at least one of the following measures: severe depression (6%), PTSD (40%), severe anxiety (11%) or problem drinking (7%). Thirteen per cent of respondents reported frequent thoughts of being better off dead, or of hurting themselves in the past 2 weeks. Within the sample used in this study, we found that doctors reported better mental health than nurses across a range of measures.

We found substantial rates of probable mental health disorders, and thoughts of self-harm, amongst ICU staff; these difficulties were especially prevalent in nurses. Whilst further work is needed to better understand the real level of clinical need amongst ICU staff, these results indicate the need for a national strategy to protect the mental health, and decrease the risk of functional impairment, of ICU staff whilst they carry out their essential work during COVID-19."

PLoS One: [Sex differences in susceptibility, severity, and outcomes of coronavirus disease 2019: Cross-sectional analysis from a diverse US metropolitan area](#)

"Sex is increasingly recognized as an important factor in the epidemiology and outcome of many diseases. This also appears to hold for coronavirus disease 2019 (COVID-19). Evidence from China and Europe has suggested that mortality from COVID-19 infection is higher in men than women, but evidence from US populations is lacking. Utilizing data from a large healthcare provider, we determined if males, as compared to females have a higher likelihood of SARS-CoV-2 susceptibility, and if among the hospitalized COVID-19 patients, male sex is independently associated with COVID-19 severity and poor in-hospital outcomes.

Using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines, we conducted a cross-sectional analysis of data from a COVID-19 Surveillance and Outcomes Registry (CURATOR). Data were extracted from Electronic Medical Records (EMR). A total of 96,473 individuals tested for SARS-CoV-2 RNA in nasopharyngeal swab specimens via Polymerized Chain Reaction (PCR) tests were included. For hospital-based analyses, all patients admitted during the same time-period were included. Of the 96,473 patients tested, 14,992 (15.6%) tested positive, of whom 4,785 (31.9%) were hospitalized and 452 (9.5%) died. Among all patients tested, men were significantly older. The overall SARS-CoV-2 positivity among all tested individuals was 15.5%, and was higher in males as compared to females 17.0% vs. 14.6% [OR 1.20]. This sex difference held after adjusting for age, race, ethnicity, marital status, insurance type, median income, BMI, smoking and 17 comorbidities included in Charlson Comorbidity Index (CCI) [aOR 1.39]. A higher proportion of males (vs. females) experienced pulmonary (ARDS, hypoxic respiratory failure) and extra-pulmonary (acute renal injury) complications during their hospital course. After adjustment, length of stay (LOS), need for mechanical ventilation, and in-hospital mortality were significantly higher in males as compared to females.

In this analysis of a large US cohort, males were more likely to test positive for COVID-19. In hospitalized patients, males were more likely to have complications, require ICU admission and mechanical ventilation, and had higher mortality than females, independent of age. Sex disparities in COVID-19 vulnerability are present, and emphasize the importance of examining sex-disaggregated data to improve our understanding of the biological processes involved to potentially tailor treatment and risk stratify patients."

12 January 2021

Science: [Immunological characteristics govern the transition of COVID-19 to endemicity](#)

"We are currently faced with the question of how the CoV-2 severity may change in the years ahead. Our analysis of immunological and epidemiological data on endemic human coronaviruses (HCoVs) shows that infection-blocking immunity wanes rapidly, but disease-reducing immunity is long-lived. Our model, incorporating these components of immunity, recapitulates both the current severity of CoV-2 and the benign nature of HCoVs, suggesting that once the endemic phase is reached and primary exposure is in childhood, CoV-2 may be no more virulent than the common cold. We predict a different outcome for an emergent coronavirus that causes severe disease in children. These results reinforce the importance of behavioral containment during pandemic vaccine rollout, while prompting us to evaluate scenarios for continuing vaccination in the endemic phase."

11 January 2021

JACC: [Cardiovascular Deaths During the COVID-19 Pandemic in the United States](#)

"The authors conducted an observational cohort study using data from the National Center for Health Statistics to evaluate the rate of deaths due to cardiovascular causes after the onset of the pandemic in the United States, from March 18, 2020, to June 2, 2020, relative to the period immediately preceding the pandemic (January 1, 2020 to March 17, 2020). Changes in deaths were compared with the same periods in the previous year.

There were 397,042 cardiovascular deaths from January 1, 2020, to June 2, 2020. Deaths caused by ischemic heart disease increased nationally after the onset of the pandemic in 2020, compared with changes over the same period in 2019 (ratio of the relative change in deaths per 100,000 in 2020 vs. 2019: 1.11, 95% confidence interval: 1.04 to 1.18). An increase was also observed for deaths caused by hypertensive disease (1.17, 95% confidence interval: 1.09 to 1.26), but not for heart failure, cerebrovascular disease, or other diseases of the circulatory system. New York City experienced a large relative increase in deaths caused by ischemic heart disease (2.39, 95% confidence interval: 1.39 to 4.09) and hypertensive diseases (2.64, 95% confidence interval: 1.52 to 4.56) during the pandemic. More modest increases in deaths caused by these conditions occurred in the remainder of New York State, New Jersey, Michigan, and Illinois but not in Massachusetts or Louisiana.

There was an increase in deaths caused by ischemic heart disease and hypertensive diseases in some regions of the United States during the initial phase of the COVID-19 pandemic. These findings suggest that the pandemic may have had an indirect toll on patients with cardiovascular disease."

JACC: [International Impact of COVID-19 on the Diagnosis of Heart Disease](#)

"The International Atomic Energy Agency conducted a worldwide survey assessing alterations in cardiovascular procedure volumes and safety practices resulting from COVID-19. Noninvasive and invasive cardiac testing volumes were obtained from participating sites for March and April 2020 and compared with those from March 2019. Availability of personal protective equipment and pandemic-related testing practice changes were ascertained.

Surveys were submitted from 909 inpatient and outpatient centers performing cardiac diagnostic procedures, in 108 countries. Procedure volumes decreased 42% from March 2019 to March 2020, and 64% from March 2019 to April 2020. Transthoracic echocardiography decreased by 59%, transesophageal echocardiography 76%, and stress tests 78%, which varied between stress modalities. Coronary angiography (invasive or computed tomography) decreased 55% ($p < 0.001$ for each procedure). In multivariable regression, significantly greater reduction in procedures occurred for centers in countries with lower gross domestic product. Location in a low-income and lower-middle-income country was associated with an additional 22% reduction in cardiac procedures and less availability of personal protective equipment and telehealth.

COVID-19 was associated with a significant and abrupt reduction in cardiovascular diagnostic testing across the globe, especially affecting the world's economically challenged. Further study of cardiovascular outcomes and COVID-19-related changes in care delivery is warranted."

JAMA Pediatr: [Trends in Pediatric Hospitalizations for Coronavirus Disease 2019](#)

"This study examines coronavirus disease 2019 hospitalization trends for pediatric patients in 22 states."

Nature: [Circuits between infected macrophages and T cells in SARS-CoV-2 pneumonia](#)

"Some patients infected with Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) develop severe pneumonia and the acute respiratory distress syndrome (ARDS)¹. Distinct clinical features in these patients have led to speculation that the immune response to virus in the SARS-CoV-2-infected alveolus differs from other types of pneumonia². We collected bronchoalveolar lavage fluid samples from 88 patients with SARS-CoV-2-induced respiratory failure and 211 patients with known or suspected pneumonia from other pathogens and subjected them to flow cytometry and bulk transcriptomic profiling. We performed single-cell RNA-seq on 10 bronchoalveolar lavage fluid samples collected from patients with severe COVID-19 within 48 hours of intubation. In the majority of patients with SARS-CoV-2 infection, the alveolar space was persistently enriched in T cells and monocytes. Bulk and single-cell transcriptomic profiling suggested that SARS-CoV-2 infects alveolar macrophages,

which in turn respond by producing T cell chemoattractants. These T cells produce interferon-gamma to induce inflammatory cytokine release from alveolar macrophages and further promote T cell activation. Collectively, our results suggest that SARS-CoV-2 causes a slowly unfolding, spatially limited alveolitis in which alveolar macrophages harboring SARS-CoV-2 and T cells form a positive feedback loop that drives persistent alveolar inflammation."

PLoS Med: [Social determinants of mortality from COVID-19: A simulation study using NHANES](#)

"We estimated the proportions of COVID-19 deaths by age, sex, race/ethnicity, and comorbid conditions using their reported univariate proportions among COVID-19 deaths and correlations among these variables in the general population from the 2017–2018 National Health and Nutrition Examination Survey (NHANES). We used these proportions to randomly sample individuals from NHANES. We analyzed the distributions of COVID-19 deaths by race/ethnicity, income, education level, and veteran status. We analyzed the association of these characteristics with mortality by logistic regression. Summary demographics of deaths include mean age 71.6 years, 45.9% female, and 45.1% non-Hispanic white. We found that disproportionate deaths occurred among individuals with nonwhite race/ethnicity (54.8% of deaths, 95% CI 49.0%–59.6%, $p < 0.001$), individuals with income below the median (67.5%, 95% CI 63.4%–71.5%, $p < 0.001$), individuals with less than a high school level of education (25.6%, 95% CI 23.4%–27.9%, $p < 0.001$), and veterans (19.5%, 95% CI 15.8%–23.4%, $p < 0.001$). Except for veteran status, these characteristics are significantly associated with COVID-19 mortality in multiple logistic regression. Limitations include the lack of institutionalized people in the sample (e.g., nursing home residents and incarcerated persons), the need to use comorbidity data collected from outside the US, and the assumption of the same correlations among variables for the noninstitutionalized population and COVID-19 decedents.

Substantial inequalities in COVID-19 mortality are likely, with disproportionate burdens falling on those who are of racial/ethnic minorities, are poor, have less education, and are veterans. Healthcare systems must ensure adequate access to these groups. Public health measures should specifically reach these groups, and data on social determinants should be systematically collected from people with COVID-19."

PNAS: [An evidence review of face masks against COVID-19](#)

"The science around the use of masks by the public to impede COVID-19 transmission is advancing rapidly. In this narrative review, we develop an analytical framework to examine mask usage, synthesizing the relevant literature to inform multiple areas: population impact, transmission characteristics, source control, wearer protection, sociological considerations, and implementation considerations. A primary route of transmission of COVID-19 is via respiratory particles, and it is known to be transmissible from

presymptomatic, paucisymptomatic, and asymptomatic individuals. Reducing disease spread requires two things: limiting contacts of infected individuals via physical distancing and other measures and reducing the transmission probability per contact. The preponderance of evidence indicates that mask wearing reduces transmissibility per contact by reducing transmission of infected respiratory particles in both laboratory and clinical contexts. Public mask wearing is most effective at reducing spread of the virus when compliance is high. Given the current shortages of medical masks, we recommend the adoption of public cloth mask wearing, as an effective form of source control, in conjunction with existing hygiene, distancing, and contact tracing strategies. Because many respiratory particles become smaller due to evaporation, we recommend increasing focus on a previously overlooked aspect of mask usage: mask wearing by infectious people ("source control") with benefits at the population level, rather than only mask wearing by susceptible people, such as health care workers, with focus on individual outcomes. We recommend that public officials and governments strongly encourage the use of widespread face masks in public, including the use of appropriate regulation."

09 January 2021

Clin Infect Dis: [Confirmed Reinfection with SARS-CoV-2 Variant VOC-202012/01](#)

Case report: "We have detected a confirmed case of reinfection with SARS-CoV-2 with the second episode due to the 'new variant' VOC-202012/01 of lineage B.1.1.7. The initial infection occurred in the first wave of the pandemic in the UK and was a mild illness. 8 months later, during the second wave of the pandemic in the UK reinfection with the 'new variant' VOC-202012/01 was confirmed and caused a critical illness."

08 January 2021

Clin Microbiol Infect: [Outbreak of Candida auris infection in a COVID-19 hospital in Mexico](#)

"The aim of this study was to describe the clinical and microbiological characteristics of twelve patients with severe COVID-19 and Candida auris co-infection.

Microbiological characterization of the isolates consisting on molecular identification, genotypification through multilocus sequence typing and antifungal susceptibility to eight antifungals was performed.

Mortality among patients with COVID-19 and C. auris candidaemia was of 83.3% even with the use of appropriate antifungal therapy. All the isolates studied were resistant to amphotericin B.

Causes related to the incidence of COVID-19 and candidaemia are not well understood but seems to be related to common contributing factor seen in critically-ill patients; nonetheless, the high mortality reported demands close attention to patients who present this co-infection."

JAMA Netw Open: [Using Lorenz Curves to Measure Racial Inequities in COVID-19 Testing](#)

"Racial disparities have been widely documented during the coronavirus disease 2019 (COVID-19) pandemic, but there has been limited focus on equitable allocation of the pandemic's most critical but limited resource: COVID-19 testing. Equitable testing is paramount to a successful COVID-19 response and is essential for early case detection, self-isolation, and overall prevention of onward transmission. We adapted a well-established tool for measuring inequity from economics—the Lorenz curve—to put forth a metric for quantifying COVID-19 related inequities."

Lancet: [6-month consequences of COVID-19 in patients discharged from hospital: a cohort study](#)

"We did an ambidirectional cohort study of patients with confirmed COVID-19 who had been discharged from Jin Yin-tan Hospital (Wuhan, China) between Jan 7, 2020, and May 29, 2020. Patients who died before follow-up, patients for whom follow-up would be difficult because of psychotic disorders, dementia, or re-admission to hospital, those who were unable to move freely due to concomitant osteoarthropathy or immobile before or after discharge due to diseases such as stroke or pulmonary embolism, those who declined to participate, those who could not be contacted, and those living outside of Wuhan or in nursing or welfare homes were all excluded. All patients were interviewed with a series of questionnaires for evaluation of symptoms and health-related quality of life, underwent physical examinations and a 6-min walking test, and received blood tests. A stratified sampling procedure was used to sample patients according to their highest seven-category scale during their hospital stay as 3, 4, and 5-6, to receive pulmonary function test, high resolution CT of the chest, and ultrasonography. Enrolled patients who had participated in the Lopinavir Trial for Suppression of SARS-CoV-2 in China received severe acute respiratory syndrome coronavirus 2 antibody tests. Multivariable adjusted linear or logistic regression models were used to evaluate the association between disease severity and long-term health consequences.

In total, 1733 of 2469 discharged patients with COVID-19 were enrolled after 736 were excluded. Patients had a median age of 57·0 (IQR 47·0-65·0) years and 897 (52%) were men. The follow-up study was done from June 16, to Sept 3, 2020, and the median follow-up time after symptom onset was 186·0 (175·0-199·0) days. Fatigue or muscle weakness (63%, 1038 of 1655) and sleep difficulties (26%, 437 of 1655) were the most common symptoms. Anxiety or depression was reported among 23% (367 of 1617) of patients. The proportions

of median 6-min walking distance less than the lower limit of the normal range were 24% for those at severity scale 3, 22% for severity scale 4, and 29% for severity scale 5-6. The corresponding proportions of patients with diffusion impairment were 22% for severity scale 3, 29% for scale 4, and 56% for scale 5-6, and median CT scores were 3.0 (IQR 2.0-5.0) for severity scale 3, 4.0 (3.0-5.0) for scale 4, and 5.0 (4.0-6.0) for scale 5-6. After multivariable adjustment, patients showed an odds ratio (OR) 1.61 (95% CI 0.80-3.25) for scale 4 versus scale 3 and 4.60 (1.85-11.48) for scale 5-6 versus scale 3 for diffusion impairment; OR 0.88 (0.66-1.17) for scale 4 versus scale 3 and OR 1.77 (1.05-2.97) for scale 5-6 versus scale 3 for anxiety or depression, and OR 0.74 (0.58-0.96) for scale 4 versus scale 3 and 2.69 (1.46-4.96) for scale 5-6 versus scale 3 for fatigue or muscle weakness. Of 94 patients with blood antibodies tested at follow-up, the seropositivity (96.2% vs 58.5%) and median titres (19.0 vs 10.0) of the neutralising antibodies were significantly lower compared with at the acute phase. 107 of 822 participants without acute kidney injury and with estimated glomerular filtration rate (eGFR) 90 mL/min per 1.73 m² or more at acute phase had eGFR less than 90 mL/min per 1.73 m² at follow-up.

At 6 months after acute infection, COVID-19 survivors were mainly troubled with fatigue or muscle weakness, sleep difficulties, and anxiety or depression. Patients who were more severely ill during their hospital stay had more severe impaired pulmonary diffusion capacities and abnormal chest imaging manifestations, and are the main target population for intervention of long-term recovery."

Lancet Respir Med: [Prevalence and risk factors for delirium in critically ill patients with COVID-19 \(COVID-D\): a multicentre cohort study](#)

"This multicentre cohort study included 69 adult intensive care units (ICUs), across 14 countries. We included all patients (aged ≥18 years) admitted to participating ICUs with severe acute respiratory syndrome coronavirus 2 infection before April 28, 2020. Patients who were moribund or had life-support measures withdrawn within 24 h of ICU admission, prisoners, patients with pre-existing mental illness, neurodegenerative disorders, congenital or acquired brain damage, hepatic coma, drug overdose, suicide attempt, or those who were blind or deaf were excluded. We collected de-identified data from electronic health records on patient demographics, delirium and coma assessments, and management strategies for a 21-day period. Additional data on ventilator support, ICU length of stay, and vital status was collected for a 28-day period. The primary outcome was to determine the prevalence of delirium and coma and to investigate any associated risk factors associated with development of delirium the next day. We also investigated predictors of number of days alive without delirium or coma. These outcomes were investigated using multivariable regression.

Between Jan 20 and April 28, 2020, 4530 patients with COVID-19 were admitted to 69 ICUs, of whom 2088 patients were included in the study cohort. The median age of patients was

64 years (IQR 54 to 71) with a median Simplified Acute Physiology Score (SAPS) II of 40.0 (30.0 to 53.0). 1397 (66.9%) of 2088 patients were invasively mechanically ventilated on the day of ICU admission and 1827 (87.5%) were invasively mechanical ventilated at some point during hospitalisation. Infusion with sedatives while on mechanical ventilation was common: 1337 (64.0%) of 2088 patients were given benzodiazepines for a median of 7.0 days (4.0 to 12.0) and 1481 (70.9%) were given propofol for a median of 7.0 days (4.0 to 11.0). Median Richmond Agitation–Sedation Scale score while on invasive mechanical ventilation was –4 (–5 to –3). 1704 (81.6%) of 2088 patients were comatose for a median of 10.0 days (6.0 to 15.0) and 1147 (54.9%) were delirious for a median of 3.0 days (2.0 to 6.0). Mechanical ventilation, use of restraints, and benzodiazepine, opioid, and vasopressor infusions, and antipsychotics were each associated with a higher risk of delirium the next day (all $p \leq 0.04$), whereas family visitation (in person or virtual) was associated with a lower risk of delirium ($p < 0.0001$). During the 21-day study period, patients were alive without delirium or coma for a median of 5.0 days (0.0 to 14.0). At baseline, older age, higher SAPS II scores, male sex, smoking or alcohol abuse, use of vasopressors on day 1, and invasive mechanical ventilation on day 1 were independently associated with fewer days alive and free of delirium and coma (all $p < 0.01$). 601 (28.8%) of 2088 patients died within 28 days of admission, with most of those deaths occurring in the ICU.

Acute brain dysfunction was highly prevalent and prolonged in critically ill patients with COVID-19. Benzodiazepine use and lack of family visitation were identified as modifiable risk factors for delirium, and thus these data present an opportunity to reduce acute brain dysfunction in patients with COVID-19."

MMWR: [Time from Start of Quarantine to SARS-CoV-2 Positive Test Among Quarantined College and University Athletes — 17 States, June–October 2020](#)

"What is already known about this topic? Quarantine after SARS-CoV-2 exposure is critical to preventing transmission. A 14-day quarantine can prevent further transmission but might be challenging to maintain.

What is added by this report? Among collegiate athletes exposed to COVID-19, one quarter had positive test results during quarantine. Among athletes who had not received a positive test result by day 5, the probability of testing positive decreased from 27% after day 5 to <5% after day 10.

What are the implications for public health practice? Among young, healthy athletes, the probability of receiving positive test results after day 10 of quarantine is low. A shorter quarantine after COVID-19 exposure could increase adherence but still poses a small residual risk for transmission."

Science: [Establishment and lineage dynamics of the SARS-CoV-2 epidemic in the UK](#)

"The UK's COVID-19 epidemic during early 2020 was one of world's largest and unusually well represented by virus genomic sampling. Here we reveal the fine-scale genetic lineage structure of this epidemic through analysis of 50,887 SARS-CoV-2 genomes, including 26,181 from the UK sampled throughout the country's first wave of infection. Using large-scale phylogenetic analyses, combined with epidemiological and travel data, we quantify the size, spatio-temporal origins and persistence of genetically-distinct UK transmission lineages. Rapid fluctuations in virus importation rates resulted in >1000 lineages; those introduced prior to national lockdown tended to be larger and more dispersed. Lineage importation and regional lineage diversity declined after lockdown, while lineage elimination was size-dependent. We discuss the implications of our genetic perspective on transmission dynamics for COVID-19 epidemiology and control."

07 January 2021

Eur J Clin Microbiol Infect Dis: [Diagnosis of SARS-CoV-2 in children: accuracy of nasopharyngeal swab compared to nasopharyngeal aspirate](#)

"The tests currently used for the identification of SARS-CoV-2 include specimens taken from the upper and lower respiratory tract. Although recommendations from the World Health Organization prioritise the usage of a nasopharyngeal swab (NS), nasopharyngeal aspirates (NPA) are thought to be superior in identifying SARS-CoV-2 in children. To our knowledge, however, no paediatric study has been published on the subject. The aim of this study is to evaluate the diagnostic performances of NS referred to NPA for SARS-CoV-2 in children. We calculated the sensitivity and specificity of the NS referred to the NPA of the whole sample and considered both age and collection period as covariates in different analyses. We collected 300 paired samples. The NS had a specificity of 97.7% and a sensitivity of 58.1%. We found similar results for the group of subjects ≥ 6 years old, while for subjects < 6 years old, the sensitivity was 66.7% and the specificity 97.8%. Considering period as a covariate, the sensitivity and specificity for patients hospitalised in March (31 patients, 52 records) were 70.0% and 97.6%, while for patients involved in the follow-up (16 patients, 57 records), they were 57.2% and 89.7%. The NS has a low sensitivity in detecting SARS-CoV-2 in children when referred to the NPA, whereas its specificity is high. Our results suggest that in children under 6 years of age, NSs should be preferred whenever possible. Though statistically not significant, the sensitivity of the NS rises when performed before the NPA."

JAMA Netw Open: [SARS-CoV-2 Transmission From People Without COVID-19 Symptoms](#)

"Question: What proportion of coronavirus disease 2019 (COVID-19) spread is associated with transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from persons with no symptoms?

Findings: In this decision analytical model assessing multiple scenarios for the infectious period and the proportion of transmission from individuals who never have COVID-19 symptoms, transmission from asymptomatic individuals was estimated to account for more than half of all transmission.

Meaning: The findings of this study suggest that the identification and isolation of persons with symptomatic COVID-19 alone will not control the ongoing spread of SARS-CoV-2."

06 January 2021

NEJM: [Early High-Titer Plasma Therapy to Prevent Severe Covid-19 in Older Adults](#)

"We conducted a randomized, double-blind, placebo-controlled trial of convalescent plasma with high IgG titers against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in older adult patients within 72 hours after the onset of mild Covid-19 symptoms. The primary end point was severe respiratory disease, defined as a respiratory rate of 30 breaths per minute or more, an oxygen saturation of less than 93% while the patient was breathing ambient air, or both. The trial was stopped early at 76% of its projected sample size because cases of Covid-19 in the trial region decreased considerably and steady enrollment of trial patients became virtually impossible.

A total of 160 patients underwent randomization. In the intention-to-treat population, severe respiratory disease developed in 13 of 80 patients (16%) who received convalescent plasma and 25 of 80 patients (31%) who received placebo (relative risk, 0.52; 95% confidence interval [CI], 0.29 to 0.94; $P = 0.03$), with a relative risk reduction of 48%. A modified intention-to-treat analysis that excluded 6 patients who had a primary end-point event before infusion of convalescent plasma or placebo showed a larger effect size (relative risk, 0.40; 95% CI, 0.20 to 0.81). No solicited adverse events were observed.

Early administration of high-titer convalescent plasma against SARS-CoV-2 to mildly ill infected older adults reduced the progression of Covid-19."

NEJM: [Beyond Politics — Promoting Covid-19 Vaccination in the United States](#)

This commentary discusses the measures and strategies to support vaccine uptake, counter vaccine hesitancy, and communicate effectively about the COVID-19 vaccines.

See also JAMA: [Behaviorally Informed Strategies for a National COVID-19 Vaccine Promotion Program](#) from 14 December 2020.

05 January 2021

Clin Infect Dis: [Venous thromboembolism and major bleeding in patients with COVID-19: A nationwide population-based cohort study](#)

"Venous thromboembolism (VTE) is a potentially fatal complication of SARS-CoV-2 infection and thromboprophylaxis should be balanced against risk of bleeding. This study aimed to examine risks of VTE and major bleeding in hospitalized and community-managed SARS-CoV-2 patients compared with control populations.

Using nationwide population-based registries, 30-day risks of VTE and major bleeding in SARS-CoV-2 positive patients were compared with those of SARS-CoV-2 test-negative patients and with an external cohort of influenza patients. Medical records of all COVID-19 patients at six departments of infectious diseases in Denmark were reviewed in detail.

The overall 30-day risk of VTE was 0.4% (40/9,460) among SARS-CoV-2 patients (16% hospitalized), 0.3% (649/226,510) among SARS-CoV-2 negative subjects (12% hospitalized), and 1.0% (158/16,281) among influenza patients (59% hospitalized). VTE risks were higher and comparable in hospitalized SARS-CoV-2 positive (1.5%), SARS-CoV-2 negative (1.8%), and influenza patients (1.5%). Diagnosis of major bleeding was registered in 0.5% (47/9,460) of all SARS-CoV-2 positive individuals and in 2.3% of those hospitalized. Medical record review of 582 hospitalized SARS-CoV-2 patients observed VTE in 4% (19/450) and major bleeding in 0.4% (2/450) of ward patients, of whom 31% received thromboprophylaxis. Among intensive care patients (100% received thromboprophylaxis), risks were 7% (9/132) for VTE and 11% (15/132) for major bleeding.

Among people with SARS-CoV-2 infection in a population-based setting, VTE risks were low to moderate and were not substantially increased compared with SARS-CoV-2 test-negative and influenza patients. Risk of severe bleeding was low for ward patients, but mirrored VTE risk in the intensive care setting."

Emerg Infect Dis: [Genomic Evidence of In-Flight Transmission of SARS-CoV-2 Despite Predeparture Testing](#)

"Since the first wave of coronavirus disease in March 2020, citizens and permanent residents returning to New Zealand have been required to undergo managed isolation and quarantine (MIQ) for 14 days and mandatory testing for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). As of October 20, 2020, of 62,698 arrivals, testing of persons in MIQ had identified 215 cases of SARS-CoV-2 infection. Among 86 passengers on a flight

from Dubai, United Arab Emirates, that arrived in New Zealand on September 29, test results were positive for 7 persons in MIQ. These passengers originated from 5 different countries before a layover in Dubai; 5 had negative predeparture SARS-CoV-2 test results. To assess possible points of infection, we analyzed information about their journeys, disease progression, and virus genomic data. All 7 SARS-CoV-2 genomes were genetically identical, except for a single mutation in 1 sample. Despite predeparture testing, multiple instances of in-flight SARS-CoV-2 transmission are likely."

Retraction Watch

An article published on 31 December 2020 and listed in last week's NMCP lit report has been withdrawn. Per the publisher: "The publisher regrets that this article has been temporarily removed. A replacement will appear as soon as possible in which the reason for the removal of the article will be specified, or the article will be reinstated."

Citation:

J Allergy Clin Immunol Pract: Banerji A, Wickner PG, Saff R, Stone CA Jr, Robinson LB, Long AA, Wolfson AR, Williams P, Khan DA, Phillips E, Blumenthal KG. mRNA Vaccines to Prevent COVID-19 Disease and Reported Allergic Reactions: Current Evidence and Approach. J Allergy Clin Immunol Pract. 2020 Dec 31:S2213-2198(20)31411-2. doi: 10.1016/j.jaip.2020.12.047. Epub ahead of print. PMID: 33388478. Link: <https://www.sciencedirect.com/science/article/pii/S2213219820314112>

ICYMI (older than the last 2 weeks)

Tuberc Respir Dis: [Association between oxygen saturation/fraction of inhaled oxygen and mortality in patients with COVID-19 associated pneumonia requiring oxygen therapy](#) (online 28 December 2020)

" Coronavirus disease 2019 (COVID-19) can manifest from asymptomatic to acute respiratory distress syndrome (ARDS). COVID-19 associated pneumonia develops into ARDS due to rapid progression of hypoxia. Although arterial blood gas analysis (ABGA) should be implemented to confirm this deterioration, it is not easy to obtain such tests in the COVID-19 environment. Therefore, this study was conducted to determine whether oxygen saturation (SpO₂) and SpO₂/fraction of inhaled oxygen (FiO₂) (SF ratio) predicts ARDS and mortality.

This was a retrospective cohort study that enrolled COVID-19 pneumonia patients requiring oxygen therapy from Feb 2020 to May 2020. Of 100 COVID-19 pneumonia cases, we

compared 59 cases of pneumonia requiring oxygen, divided into ARDS and non-ARDS pneumonia requiring oxygen. The factors affecting mortality were investigated.

At the time of admission, the SpO₂, FiO₂, and SF ratios of the ARDS group were significantly different from those of the non-ARDS pneumonia requiring oxygen support group ($P < 0.001$, respectively). With respect to predicting occurrence of ARDS, the SF ratio on admission and the SF ratio at exacerbation showed an overall area under the curve of 85.7% and 88.8% ($P < 0.001$, respectively). Multivariate Cox regression analysis identified the SF ratio at exacerbation (HR, 0.916; 95% CI, 0.846–0.991; $P = 0.029$) and National Early Warning Score (NEWS) (HR, 1.277; 95% CI, 1.010–1.615; $P = 0.041$) as significant predictors of mortality.

The SF ratio on admission and the SF ratio at exacerbation can predict occurrence of ARDS. The SF ratio at exacerbation and NEWS has a significant effect on mortality."

Emerg Infect Dis: [Characteristics of Patients Co-infected with Severe Acute Respiratory Syndrome Coronavirus 2 and Dengue Virus, Buenos Aires, Argentina, March–June 2020](#) (online 21 December 2020)

"An epidemic of dengue virus and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) co-infections occurred in Argentina during 2020. We describe the clinical characteristics and outcomes in a cohort of patients hospitalized because of co-infection. We retrospectively identified 13 patients from different hospitals in Buenos Aires who had confirmed infection with SARS-CoV-2 and dengue virus and obtained clinical and laboratory data from clinical records. All patients had febrile disease when hospitalized. Headache was a common symptom. A total of 8 patients had respiratory symptoms, 5 had pneumonia, and 3 had rash. Nearly all patients had lymphopenia when hospitalized. No patients were admitted to an intensive care unit or died during follow up. Co-infection with SARS-CoV-2 and dengue virus can occur in patients living in areas in which both viruses are epidemic. The outcome of these patients did not seem to be worse than those having either SARS-CoV-2 or dengue infection alone."

J Korean Med Sci: [Psychological Consequences of Survivors of COVID-19 Pneumonia 1 Month after Discharge](#) (online 07 December 2020)

"As the coronavirus disease 2019 (COVID-19) has rapidly spread worldwide, there are growing concerns about patients' mental health. We investigated psychological problems in COVID-19 patients assessed with self-reported questionnaires including the Patient Health Questionnaire-9, Generalized Anxiety Disorder-7 scale, and Impact of Event Scale-Revised Korean version. Ten patients who recovered from COVID-19 pneumonia without complications underwent self-reported questionnaires about 1 month after discharge. Of them, 10% reported depression and posttraumatic stress disorder (PTSD) while 50% had depression during the treatment. Perceived stigma and history of psychiatric treatment affected PTSD symptom severity, consistent with previous emerging infectious diseases.

Survivors also reported that they were concerned about infecting others and being discriminated and that they chose to avoid others after discharge. Further support and strategy to minimize their psychosocial difficulties after discharge should be considered."

JMIR Public Health Surveill: [Evaluating the Need for Routine COVID-19 Testing of Emergency Department Staff: Quantitative Analysis](#) (published 03 December 2020)

"As the number of COVID-19 cases in the US continues to increase and hospitals experience shortage of personal protective equipment (PPE), health care workers have been disproportionately affected. However, since COVID-19 testing is now easily available, there is a need to evaluate whether routine testing should be performed for asymptomatic health care workers.

This study aimed to provide a quantitative analysis of the predicted impact that regular testing of health care workers for COVID-19 may have on the prevention of the disease among emergency department patients and staff.

Using publicly available data on COVID-19 cases and emergency department visits, as well as internal hospital staffing information, we developed a mathematical model to predict the impact of periodic COVID-19 testing of asymptomatic staff members of the emergency department in COVID-19-affected regions. We calculated various transmission constants based on the Diamond Princess cruise ship data, used a logistic model to calculate new infections, and developed a Markov model based on the average incubation period for COVID-19.

Our model predicts that after 180 days, with a transmission constant of 1.219×10^{-4} new infections/person², weekly COVID-19 testing of health care workers would reduce new health care worker and patient infections by approximately 3%-5.9%, and biweekly testing would reduce infections in both by 1%-2.1%. At a transmission constant of 3.660×10^{-4} new infections/person², weekly testing would reduce infections by 11%-23% and biweekly testing would reduce infections by 5.5%-13%. At a lower transmission constant of 4.067×10^{-5} new infections/person², weekly and biweekly COVID-19 testing for health care workers would result in an approximately 1% and 0.5%-0.8% reduction in infections, respectively.

Periodic COVID-19 testing for emergency department staff in regions that are heavily affected by COVID-19 or are facing resource constraints may significantly reduce COVID-19 transmission among health care workers and previously uninfected patients."

Selected Literature: Preprints

Preprints are found on preprint servers such as [arXiv](#), [bioRxiv](#), and [medRxiv](#); they are commonly used for biomedical research. Preprints may later be published in peer-reviewed journals. Per

medRxiv: "Preprints are preliminary reports of work that have not been certified by peer review. They should not be relied on to guide clinical practice or health-related behavior and should not be reported in news media as established information."

medRxiv: [Saliva viral load is a dynamic unifying correlate of COVID-19 severity and mortality](#) (posted 10 January 2021)

"While several clinical and immunological parameters correlate with disease severity and mortality in SARS-CoV-2 infection, work remains in identifying unifying correlates of coronavirus disease 2019 (COVID-19) that can be used to guide clinical practice. Here, we examine saliva and nasopharyngeal (NP) viral load over time and correlate them with patient demographics, and cellular and immune profiling. We found that saliva viral load was significantly higher in those with COVID-19 risk factors; that it correlated with increasing levels of disease severity and showed a superior ability over nasopharyngeal viral load as a predictor of mortality over time (AUC=0.90). A comprehensive analysis of immune factors and cell subsets revealed strong predictors of high and low saliva viral load, which were associated with increased disease severity or better overall outcomes, respectively. Saliva viral load was positively associated with many known COVID-19 inflammatory markers such as IL-6, IL-18, IL-10, and CXCL10, as well as type 1 immune response cytokines. Higher saliva viral loads strongly correlated with the progressive depletion of platelets, lymphocytes, and effector T cell subsets including circulating follicular CD4 T cells (cTfh). Anti-spike (S) and anti-receptor binding domain (RBD) IgG levels were negatively correlated with saliva viral load showing a strong temporal association that could help distinguish severity and mortality in COVID-19. Finally, patients with fatal COVID-19 exhibited higher viral loads, which correlated with the depletion of cTfh cells, and lower production of anti-RBD and anti-S IgG levels. Together these results demonstrated that viral load – as measured by saliva but not nasopharyngeal – is a dynamic unifying correlate of disease presentation, severity, and mortality over time."

medRxiv: [Interleukin-6 Receptor Antagonists in Critically Ill Patients with Covid-19 - Preliminary report](#) (posted 09 January 2021)

"Background: The efficacy of interleukin-6 receptor antagonists in critically ill patients with coronavirus disease 2019 (Covid-19) is unclear.

Methods: We evaluated tocilizumab and sarilumab in an ongoing international, multifactorial, adaptive platform trial. Adult patients with Covid-19, within 24 hours of commencing organ support in an intensive care unit, were randomized to receive either tocilizumab (8mg/kg) or sarilumab (400mg) or standard care (control). The primary outcome was an ordinal scale combining in-hospital mortality (assigned -1) and days free of organ

support to day 21. The trial uses a Bayesian statistical model with pre-defined triggers to declare superiority, efficacy, equivalence or futility.

Results: Tocilizumab and sarilumab both met the pre-defined triggers for efficacy. At the time of full analysis 353 patients had been assigned to tocilizumab, 48 to sarilumab and 402 to control. Median organ support-free days were 10 (interquartile range [IQR] -1, 16), 11 (IQR 0, 16) and 0 (IQR -1, 15) for tocilizumab, sarilumab and control, respectively. Relative to control, median adjusted odds ratios were 1.64 (95% credible intervals [CrI] 1.25, 2.14) for tocilizumab and 1.76 (95%CrI 1.17, 2.91) for sarilumab, yielding >99.9% and 99.5% posterior probabilities of superiority compared with control. Hospital mortality was 28.0% (98/350) for tocilizumab, 22.2% (10/45) for sarilumab and 35.8% (142/397) for control. All secondary outcomes and analyses supported efficacy of these IL-6 receptor antagonists.

Conclusions: In critically ill patients with Covid-19 receiving organ support in intensive care, treatment with the IL-6 receptor antagonists, tocilizumab and sarilumab, improved outcome, including survival."

bioRxiv: [Comprehensive mapping of mutations to the SARS-CoV-2 receptor-binding domain that affect recognition by polyclonal human serum antibodies](#) (posted 04 January 2021)

"The evolution of SARS-CoV-2 could impair recognition of the virus by human antibody-mediated immunity. To facilitate prospective surveillance for such evolution, we map how convalescent serum antibodies are impacted by all mutations to the spike's receptor-binding domain (RBD), the main target of serum neutralizing activity. Binding by polyclonal serum antibodies is affected by mutations in three main epitopes in the RBD, but there is substantial variation in the impact of mutations both among individuals and within the same individual over time. Despite this inter- and intra-person heterogeneity, the mutations that most reduce antibody binding usually occur at just a few sites in the RBD's receptor binding motif. The most important site is E484, where neutralization by some sera is reduced >10-fold by several mutations, including one in emerging viral lineages in South Africa and Brazil. Going forward, these serum escape maps can inform surveillance of SARS-CoV-2 evolution."

medRxiv: [Transmission of SARS-CoV-2 Lineage B.1.1.7 in England: Insights from linking epidemiological and genetic data](#) (posted 04 January 2021)

"The SARS-CoV-2 lineage B.1.1.7, now designated Variant of Concern 202012/01 (VOC) by Public Health England, originated in the UK in late Summer to early Autumn 2020. We examine epidemiological evidence for this VOC having a transmission advantage from several perspectives. First, whole genome sequence data collected from community-based diagnostic testing provides an indication of changing prevalence of different genetic variants through time. Phylodynamic modelling additionally indicates that genetic diversity of this lineage has changed in a manner consistent with exponential growth. Second, we

find that changes in VOC frequency inferred from genetic data correspond closely to changes inferred by S-gene target failures (SGTF) in community-based diagnostic PCR testing. Third, we examine growth trends in SGTF and non-SGTF case numbers at local area level across England, and show that the VOC has higher transmissibility than non-VOC lineages, even if the VOC has a different latent period or generation time. Available SGTF data indicate a shift in the age composition of reported cases, with a larger share of under 20 year olds among reported VOC than non-VOC cases. Fourth, we assess the association of VOC frequency with independent estimates of the overall SARS-CoV-2 reproduction number through time. Finally, we fit a semi-mechanistic model directly to local VOC and non-VOC case incidence to estimate the reproduction numbers over time for each. There is a consensus among all analyses that the VOC has a substantial transmission advantage, with the estimated difference in reproduction numbers between VOC and non-VOC ranging between 0.4 and 0.7, and the ratio of reproduction numbers varying between 1.4 and 1.8. We note that these estimates of transmission advantage apply to a period where high levels of social distancing were in place in England; extrapolation to other transmission contexts therefore requires caution."

News in Brief

The New Variants

The B117 (aka VOC 202012/01) variant – first reported in the UK on 14 December 2020 – has now been detected in 50 countries ([WHO](#)).

Researchers at The Ohio State University medical center have reported a new variant with a mutation identical to the UK strain and other mutations not seen elsewhere ([OSU](#)).

Other variants – some with mutations similar to the UK one – have been found in Nigeria ([WashPo](#)), South Africa ([CNBC](#)), and Japan ([Bloomberg](#)).

All these new SARS-CoV-2 variants being discovered – many of them linked to increased transmission – could make things a lot worse ([STAT](#)).

"Could new COVID variants undermine vaccines? Labs scramble to find out" ([Nature](#)).

Transmission and Mitigation

The CDC now requires a negative COVID-19 test to enter the US for passengers traveling by air ([CDC](#)).

Building ventilation is a concern with COVID-19; here's what it takes to make a building's ventilation pandemic proof ([CityLab](#)).

While not common, COVID reinfections happen and could be confounding transmission ([Nature](#); see also this [Clin Infect Dis article](#) and see more information on the [SIREN study](#) and a [preprint of the protocol](#)).

"Coronavirus shutdowns have quashed nearly all other common viruses. But scientists say a rebound is coming." ([WashPo](#))

Masks

Essential workers in Los Angeles are being asked to wear masks at home to help contain spread ([CNN](#)).

"Why aren't we wearing better masks?" ([Atlantic](#))

If not better masks, maybe we should wear two? ([NYT](#))

Vaccines

The special conditions needed for COVID-19 vaccines mean a slower rollout and potentially wasted doses ([KHN](#)).

"People with disabilities desperately need the vaccine. But states disagree on when they'll get it." ([WashPo](#)).

It's All About the Data

"Deaths are 25 percent higher than any other week since the pandemic began" ([COVID TP](#)).

"We don't know how many people have recovered from COVID-19" ([Atlantic](#)).

We also have little data on the results from rapid COVID antigen tests because it's not being reported at the state level – and they may not be used at all ([Atlantic](#)).

Thanks, Coronavirus

Food insecurity is an ongoing problem with the pandemic; although food aid programs are in place, the help isn't reaching needy families ([NPR](#)).

COVID-19 has been confirmed in 3 gorillas at the San Diego Zoo ([USDA](#)).

Not only can your cat get COVID-19, but they can get long covid with persistent lung effects ([Emerg Infect Dis](#)).

"Yes, the pandemic is ruining your body" ([Atlantic](#)).

Long Reads

"How COVID unlocked the power of RNA vaccines: The technology could revolutionize efforts to immunize against HIV, malaria, influenza and more" ([Nature](#)).

"Those of us who don't die are going to quit': A crush of patients, dwindling supplies and the nurse who lost hope" ([ProPublica](#)).

"It's essential to understand why some health care workers are putting off vaccination: Early data on why health care workers are delaying the Covid-19 vaccine could help us end the pandemic sooner" ([Vox](#)).

This Pandemic Has Gone to the Dogs

"So many pets have been adopted during the pandemic that shelters are running out" ([WashPo](#)).



This is Boone. He's not a pandemic adoption; he was adopted in 2010 from Nashville Humane at 14 weeks old. ->

<- He likes finding unexpected things on our walks (he's posing with a very large leaf he found a few weeks ago), begging for sweet potato treats, and demanding I take breaks during telework for snuggles.



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